

High molecular weight agents

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
<u>Animal-derived antigens</u>									
Laboratory animal	Laboratory workers	(1)	296	13%	17% +	34% of 255 +	ND	ND	
Cow dander	Agricultural workers	(2)	5	NA	100% +	100% +	Negative precipitins	100% +	
Cow bone dust	Butcher	(3)	49	NA	100%	ND	Immunoblotting	ND	
Monkey dander	Butcher	(4)	1	NA	+	+	Immunoblotting	+	
Deer dander	Laboratory workers	(5)	2	NA	2 +	2 +	ND	ND	
Mink urine	Farmer	(6)	1	NA	+	ND	ND		
Chicken	Farmer	(7)	1	NA	+	-	ND	+	
	Poultry workers	(8)	16	NA	79% +	79% +	ND	1/1 +	
	Poultry workers	(9)	4	NA	+ to feathers	ND	ND	+	
Goat dander	Butcher, veterinarian	(10)	3	NA	+	+	Immunoblotting, cross-reactivity to cow epithelium	+	
Goat cheese (goat whey)	Cheese production process	(11)	1	NA	+	ND	Immunoblotting	+	
Pig	Butcher	(12)	1	NA	ND	+	ND	ND	PEF
Pig gut (vapour from soaking water)	Pork producer	(13)	1	NA	+	+	Immunoblot	+	(soaking water)
Frog	Frog catcher	(14)	1	NA	+	+	Negative precipitins	ND	
Lactoserum	Dairy industry	(15)	1	NA	+	ND	+ Basophil degranulation	+	
Raw beef	Cook	(16)	1	NA	+	ND	SDS-Page	+	
Bovine serum albumin	Laboratory technician	(17)	1	NA	+	ND	ND	+	
Lactalbumin	Bakery and dairy	(18)	2	NA	+	+	ND	+	
Casein (cow's milk)	Tanner	(19)	1	NA	ND	+	ND	+	
Egg protein	Egg producers	(20)	188	7%	34% +	29% +	ND	ND	PEF, 7% +
Endocrine glands	Pharmacist	(21)	1	NA	+	ND	ND	+	
Bat guano	Various	(22)	7	NA	+	+	RAST inhibition	ND	
Ivory dust	Ivory worker	(23)	1	NA	neg	ND	ND	+	FEV1 at work
Nacre dust	Nacre buttons	(24)	1	NA	+	ND	Negative precipitins	+	
Sericin	Hairdresser	(25)	2	NA	1/1 +	ND	ND	ND	
Birds	Zoo keepers	(26)	200	13.6%	8%	72%	ND	ND	
				(of 147 with sensitization)	(of 147)				

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African penguin	Animal behaviourist	(27)	1	NA	ND	ND	Western blot (serum and mucus proteins)	ND	PEF changes
Royal jelly	Technicians in pharmacy	(28)	2	NA	+	+	Immunoblotting	+ (1)	PEF
Sea anemone (<i>Actinia equina</i>)	Fisherman and worker in a seafood processing plant	(29)	2	NA	+	+	Immunoblotting	+	
<u>Crustacea, seafoods, fish</u>									
Crab	Snow-crab processors	(30)	303	16%	22% +	ND	ND	72 % of 46 +	PEF, PC20
Prawn	Prawn processors	(31)	50	36%	26% +	16% +	ND	2/2 +	
Hoya (Oyster Prawn Or Sea-Squirt)		(32)	1413	29%	82% of 511 with asthma +	89% of ~ 180 with asthma +	ND	ND	
Clam and shrimp	Food processors	(33)	2	4%	+	+	RAST inhibition	+	PC20
Lobster and shrimp	Fishmonger shop	(34)	1	NA	+	+	ND	+	
Gammarus shrimp	Fishfood factory	(35)	1	NA	+	+	SDS-PAGE	+	PC20
Scallop and shrimp	Restaurant seafood handler	(36)	1	NA	+	+	SDS-PAGE	+	PEF
Small shrimp Gammarus	Technician animal food	(37)	1	NA	+	+	+ (Specific IgE protein Pen m 4)	+	
King and queen scallop	Scallop plant processor	(38)	1	NA	ND	+	SDS-PAGE	ND	PEF
Cuttle-fish	Deep-sea fishermen	(39)	66	incidence of 1%/yr	ND	ND	ND	ND	
Cuttle fish bone	Jewellery polisher	(40)	1	NA	+	ND	ND	+	
Salmon	Processing plant	(41)	291	24 (8%)	ND	25 (9%)	Specific IgG (33%)	ND	PEF
Trout	Trout processors	(42)	5	NA	ND	100% Negative	100% +	ND	
Turbot	Fish farm	(43)	3	NA	+ (3)	ND	SDS-PAGE	ND	PEF
Alaska pollock and Yellowfin sole	Workers on factory ships	(44)	7	NA	+	ND	ND	+	
Shrimpmeal (<i>Artemia salina</i>)	Restaurant worker	(45)	1	NA	+	ND	ND	+	
Red soft coral	Technician	(46)	24	3 (12.5%)	+	+	immunoblotting	ND	ND
Marine sponge	Fishermen	(47)	74	9	2/2+	ND	ND	ND	
	Laboratory grinder	(48)	1	NA	+	ND	Precipitins	ND	Asthma attack at work

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Shark cartilage	Dietetic product	(49)	1	NA	+	ND	immunoblotting	+	
Octopus	Canning factory	(50)	1	NA	+	+	SDS-PAGE; immunoblot	+	
Various fishes	Fish-processors	(51)	2	NA	+	+	ND	+	PEF
Squid (Loligo vulgaris)	Seafood production worker	(52)	1	NA	+	ND	ND	+	Eosinophilia (tears, nasal fluid, sputum)
Shrimp shell powder	Processing plant	(53)	1	NA	ND	-	Increase in specific IgG	+	Possible associated extrinsic alveolitis
<u>Arthropods</u>									
Grain pests (Eurygaster and Pyrale)	Farmers	(54)	15	NA	+	+	RAST inhibition	+	
Locust	Laboratory workers	(55)	118	26%	32% of 113	+ done	Specific IgG	ND	Reduced FEV1
		(56)	15	60%	77%	+ 53%	RAST inhibition	ND	
Screw worm fly (Cochliomya homnivorax)	Flight crew	(57)	182	25%	91% of 11	+ ND	ND	ND	
Caddis flies (Phryganeidae)	Engineer at electric power plant	(58)	1	NA	+	ND	ND	+	
Cricket	Laboratory workers	(59)	2	NA	+	+	Passive transfer	+	
Insect larvae (Galleria mellonella)	Fish bait breeder	(60)	14	NA	+	+	RAST inhibition	+	PEF
Moth, butterfly	Fish bait farmers	(61)	76	4 %	32 %	19 %	ND	ND	
Mexican bean weevil (Zabrotes subfacatus Boh.)	Entomologists	(62)	2	NA	+	ND	ND	ND	
Fruit fly	Seed house	(63)	2	NA	+	ND	Passive transfer	ND	
Mediterranean fruit fly (Ceratitis capitata)	Laboratory workers	(64)	22	32%	27%	+ 27%+	RAST inhibition	21 % of 14 +	
Honeybee	Producer of flies	(65)	2	NA	+ in two	+ in two	immunoblotting	+ in two	PEF
Green bottle fly larvae (Lucilla caesar)	Honey processors	(66)	1	NA	+	+	ND	+	
Lesser mealworm (Alphitobius diaperinus Panzer)	Anglers	(67)	14	NA	13/14	13/14	RAST inhibition	7/7 +	
Mealworm larvae (Tenibrio molitor)	Entomologists	(68)	3	NA	Negative	100% of 3 +	RAST inhibition	ND	
	Fish bait handlers	(69)	5	NA	4/5	2/5	RAST inhibition	2/2	

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Bruchus lentis	Agronomist	(70)	1	NA	+	+	immunoblotting	+	
Daphnia	Fish food-store	(71)	2	NA	+	+	ND	2/2 +	
Sheep blowfly (Lucilia cuprina)	Technicians	(72)	53	24	ND	67 % of 15 +	ND	ND	
Grasshopper	Laboratory workers	(73)	16	4 (25%)	7 (44%)	ND	ND	+ in one	
Grasshopper (Locusta migratoria)	Laboratory workers	(74)	3	NA	+	+	SDS-PAGE	ND	
Sewer fly (Psychoda alternata)	Sewage plant workers	(75)	1	NA	+	+	histamine release; F +	+	
Chironomid midges (Chironomus thummi)	Aquarists, fish-food	(76)	225	45%	80%	34%	ND	ND	
Beetles (Coleoptera)	Museum curator	(77)	1	NA	+	ND	Passive transfer	ND	
Dermestidae spp	Wool worker	(78)	1	NA	+	+	SDS-PAGE	+	
Confused flour beetle (Tribolium confusum)	Mechanics in a rye plant	(79)	1	NA	+	+	ND	ND	
Liposcelis decolor	Carpenter (work close to a granary)	(80)	1	NA	+	+	SDS-Page	ND	Improvement in symptoms away from work
Silkworm	Silk workers	(81)	53	34%	ND	ND	ND	ND	
Hering worm (Anisakis simplex)	Chicken breeder								
	Fish monger	(82)	2	NA	+	+	immunoblotting	+	
	Fish processing	(83)	578	1%	6%	ND	ND	ND	
Larva of silkworm	Sericulture	(84)	5519	0.2	100% of 9 (?)	+1 / 1 (?) +	PK	100% of 9 +	
Fish-feed Echinodorus larva (Echinodorus plamosus)	Fish-food handler	(85)	1	NA	+	+	ND	+	
Arthropods (Chrysoperia carnea, Leptinotarsa decemlineata, Ostrinia nubilalis and Ephestia kuehniella)	Technicians	(86)	3	23%	ND	+	ND	ND	
Ground bug	Bottling	(87)	1	NA	+	+	ND	ND	PEF
Nematode (Steinernema feltiae)	Technician	(88)	1	NA	+	+	ND	+	

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<u>Acarians</u>									
Grain mite	Farmers	(89)	290	12%	21% +	19% of 219 +	ND	ND	
	Grain-store workers	(90)	133	33%	25% +	23% of 128 +	ND	1/1 +	21% of 116 with + PC20
Mites and parasites	Flour handlers	(91)	12	NA	ND	+	ND	ND	
Amblyseius cucumeris	Horticulturists	(92)	472	25.7%	23%	Done in some	ND	ND	Nasal challenges
Fowl mite	Poultry workers	(93)	13	NA	77% +	60%	ND	1/1 +	
Barn mite	Farmers	(94)	38	NA	100% +	~100%	ND	ND	
Fruit tree red spider (Panonychus ulmi)	Apple growers	(95)	4	NA	+	ND	Negative precipitins	ND	
Citrus red mite (Panonychus citri)	Citrus farmers	(96)	16	NA	+	+	RAST inhibition	+ (One)	
McDaniel spider mite (Tetranychus macdanieli)	Vine growers	(97)	35	4/35 (11%)	100%	ND	ND	ND	
Two spotted spider mite (Tetranychus urticae)	Farmer	(98)	16	16/46 (35%)	100%	100%	ND	ND	
Various insects used in biological pest control	Greenhouse workers	(99)	2	NA	+	+	ND	+	
<u>Molds</u>									
Dictyostelium discoideum (mold)	Technician	(100)	1	NA	+	+	ND	Workplace +	
Aspergillus niger	Technicians	(101)	3	1%	3 +	ND	ND	ND	
Aspergillus oryzae	Work in a Sake	(102)	1	NA	?	+	Negative precipitins	+	PEF
Aspergillus(unspecified)	Beet sugar workers	(103)	1	1%	+	+	ND	ND	
	Baker	(104)	1	NA	+	ND	Negative precipitins	+	
Alternaria	Baker	(104)	1	NA	+	ND	Negative precipitins	+	
Trichoderma koningii	Sawmill worker	(105)	1	NA	ND	ND	Precipitins, specific IgG	ND	PEF
Plasmopara viticola	Agricultural	(106)	1	NA	+	+	Various	+	
Neurospora	Plywood factory worker	(107)	1	NA	+	+	ND	+	
Chrysonilia sitophila	Logging worker	(108)	1	NA	+	+	ND	ND	PEF
Rhizopus nigricans	Coffee maker	(109)	1	NA	+	+	ND	+	
	Coal miner	(110)	1	NA	+	+	ND	+	

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<u>Sooty molds</u>									
(Ascomycetes, deuteromycetes)	Laborer	(111)	1	NA	+	ND	ND	ND	
Penicillium nalgiovensis	Sausage butcher	(112)	1	NA	+	ND	+ Precipitins	ND	
Mucor species (contaminating esparto fibers)	Stucco worker	(113)	1	NA	+	ND	ND	+	
<u>Mushroom (unspecified)</u>									
	Mushroom soup processors	(114)	8	NA	+	ND	ND	50 % of 8 +	
Pleurotus cornucopiae	Mushroom producers	(115)	1	NA	ND	+	Immunoblotting	ND	PEF
Boletus edulis	Office worker, cook	(116)	3	NA	+	+	ND	2+	
	hotel manager	(117)	2	NA	+	+	SDS PAGE	ND	PC20
Agaricus bisporus (White mushroom)	Agriculture	(117)	2	NA	+	+			
Pleurotus ostreatus (Spores of White spongy rot)	Seller	(118)	1	NA	+	+	Immunoblotting	+	
<u>Sweetpea</u>									
(Lathyrus odoratus)	Greenhouse worker	(119)	1	NA	+	+	ND	ND	PEF
<u>Baker's yeast</u>									
(Saccharomyces cerevisiae)	Baker	(120)	1	NA	+	+	ND	+	PEF
Shiitake (lentinus edodes)	Packager of dried mushrooms	(121)	1	NA	+	ND	Immunoblotting	ND	Improvement in spirometry away from work
Various	Mushroom farm	(122)	1	NA	+	ND	Immunoblotting	ND	PEF
<u>Algae</u>									
Chlorella	Pharmacist	(123)	1	NA	+	ND	ND	+	PEF
Non-specified	Thalassotherapist	(124)	1	NA	ND	ND	ND	ND	+
<u>Flours</u>									
Wheat, rye and soya flour	Bakers, millers	(125)	279	35%	9% + (cereals)	ND	ND	ND	FEV1, PC20
		(126)	7	100%	100% +	100% +	100% Negative	57% +	
		(127)	9	100%	ND	100% +	Western blotting, etc.	ND	

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Hydrolyzed wheat protein	Hairdressers	(128)	2	NA	+	Negative with (laudimonium hydroxypropyl) gliadin	ND	+ in one	+ nasal challenge in one subject
White pea flour (Lathyrus sativus)	Flour handler	(129)	1	NA	+	ND	+ Precipitins	+	
Buckwheat flour	Bakers	(130)	3	NA	100% +	ND	ND	ND	
	Baker	(131)	1	NA	+	+	Immunoblotting	+	
Konjac flour	Flour handler	(132)	1	NA	+	+	RAST inhibition	+	
White Lupin flour (Lupinus albus)	Food processing	(133)	1	~ 2%	+	+	ND	+	
Marigold flour (Tagetes erecta)	Animal fodder	(134)	1	NA	+	+	Immunoblotting	ND	+ Nasal challenge
Quinoa seed flour	Milling	(135)	1	NA	+	ND	ND	ND	Increased FeNO
Corn flour	Feed store	(136)	1	NA	ND	+	ND		
<u>Pollens</u>									
Bell pepper	Greenhouse workers	(92)	472	13.3%	35.4%	18.6%	ND	ND	
Brassica oleacea pollen (cauliflower and broccoli)	Vegetable plant	(137)	54	38%	39%	58%	ND	ND	
Sunflower (Helianthus spp)	Laboratory worker	(138)	1	NA	+	+	RAST inhibition	+	
Helianthus annuus	Processing workers	(139)	102	16.6%	23.5%	ND	ND	ND	
Canari island date palm (Phoenix canariensis)	Gardener	(140)	1	NA	+	+	ND	+	
White mustard (Sinapis alba)	Olive farmers	(141)	11	NA	+	+	ND	ND	nasal challenge
Cyclamen	Florists	(142)	2	NA	+	+	ND	ND	
Eggplant (Solanum melongena)	Greenhouse worker	(143)	1	NA	+	ND	ND	+ conjunctival	PEF
Chrysanthemum	Greenhouse workers	(144)	104	9%	20.2%	+ in some	ND	ND	
Bell of Ireland (Molucella laevis)	Grower	(145)	1	NA	+	+	ND	+	PEF
Rose	Culture of roses	(146)	290	6.2%	ND	19.5%	Immunoblotting	ND	
Thale cress (Arabidopsis thaliana)	Research student	(147)	1	NA	+	ND	ND	+	PEF

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<u>Plants</u>									
Grain dust	Grain elevators	(148)	610	~40%	9% +	ND	Negative precipitins	ND	spirometry pre-post shift
	Grain elevators	(149)	502	47%	~ 50%	ND	ND	ND	FEV1, volumes
Triticale (hybrid cereal of rye and wheat)	Grain elevators	(150)			of 51 exposed +				
	Baker	(151)	22	NA	0% +	ND	Negative precipitins	27%+	50% PC 20 + PEF
	Farmer	(120)	1	NA	+	+	ND	+	
Rice	Rice mill worker	(152)	1	NA	+	+	Immunoblotting	ND	Spirometry (at work, off- work)
Vetch (<i>Vicia sativa</i>)	Farmer	(153)	3	NA	+ (3)	+	IgE inhibition test	+	
Coffee bean	Food processor	(154)	1	NA	+	+	+ Precipitins, passive transfer	+	
	Emptying	(155)	372	34%	24% +	12% +	ND	ND	Lung function
	Roastery	(156)	45	9%	9-40% +	ND	ND	ND	Spirometry
Castor bean	Oil industry	(157)	22	NA	82% +	50% +	ND	67 % of 12 + PC 20 + in 14	
Green bean (<i>Phaseolus multiflorus</i>)	Homemaker	(158)	14	NA	100% +	100% +	ND	ND	
Carob bean	Jam factory	(159)	1	NA	+	+	Histamine	+	
Lima bean (<i>Phaseolus lunatus</i>)	Cake processor	(160)	1	NA	-	+	ND	+	
Soybean (<i>glycine maxima</i>)	Soyabean processors	(161)	1	NA	+	ND	+ Basophil activation	+	
Almond shell dust	Sheller	(162)	144	20.8%	ND	ND	ND	ND	
Tea plant dust (<i>Camella sinensis</i> containing epigallocatechin gallate)	Tea processors	(163)	1	NA	-	-	ND	+	
Herbal tea	Herbal tea processors	(164)	3	NA	+	+	+ PCA with catechin	+	
Tobacco leaf	Tobacco manufac- turers	(165)	1	NA	ND	Negative	ND	+	
Wonji (<i>Polygala tenuifolia</i>)	Herbal manufacture	(166)	16	69%	ND	ND	ND	ND	PEF
Copperleaf (<i>Acalypha wikesiana</i>)	Gardener	(167)	1	NA	+	+	SDS-PAGE	+	
Hops	Brewery chemist	(168)	1	NA	+	Negative	Immunoblotting	+	
		(169)	1	NA	+	ND	ND	ND	

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Baby's breath (<i>Gypsophila paniculata</i>)	Florist	(171)	1	NA	+	+	Histamine release	+	
Freesia (<i>Freesia hybride</i>)	Horticulture	(172)	2	NA	+	+	Histamine release	ND	
and paprika (<i>Capricum anuum</i>)	Flower industry	(173)	40	7.7%	+	ND	ND	3 subjects +	
					(21%, flowers)				
Amaryllis	Greenhouse worker	(174)	1	NA	+	+	ND	+	PEF
Chamomile (unspecified)	Cosmetician	(175)	1	NA	+	ND	ND	+ Nasal challenge	
	Tea-packing worker	(176)	1	NA	+	+	ND	+	
Easter lily (<i>Lilium longiflorum</i>)	Floral shop worker	(177)	1	NA	+	+	RAST inhibition	+	PEF
Statice (<i>Limonium tataricum</i>)	Floral worker	(178)	1	NA	+	+	ND	ND	PEF
Sea lavender (<i>Limonium sinuatum</i>)	Owner of greenhouse	(179)	1	NA	+	+	Immunoblotting	+	
Decorative flower	Floral worker	(180)	4	NA	+ 2/4	+ 2/4	ND	+ 3/4	
Safflower and yarrow (<i>Carthamus tinctorius</i> and <i>achilea milefolium</i>)	Floral worker	(181)	1	NA	+	+	Immunublotting	+	
Spathe flower	Floral worker	(182)	1	NA	+	+	Immunoblotting	Negative (done 8 months later)	
Peach	Factory worker	(183)	1	NA	+	+	ND	+	
Peach leave	Fruit grower	(184)	1	NA	+	+	Immunoblotting	+	
Peach tree pollen (Pru p 9)	Workers in peach tree orchards	(185)	21	NA	100% + peach tree pollen and 43% + (Pru p 9)	43% + (Pru p 9)	Immunoblotting		Asthma symptoms (29%) and rhinitis symptoms (100%)
Soapnut (containing oil fruits with saponin) (<i>Sapindus trifoliatus</i>)	Worker in a chemical company	(186)	1	NA	+	-	+ Immunoblotting	+	changes in FEV1 and FeNO at work
Ivy (<i>Hedera helix</i>)	Florist	(187)	1	NA	-	ND	ND	+	PEF
Madagascar jasmine sap (<i>Stephanotis floribunda</i>)	Greenhouse workers	((188)	4	50%	+	+	ND	+ in one	PEF

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Herb material	Herbal worker	(189)	1	NA	+	+	Identification of 3 protein fractions	+	
Umbrella tree(Schefflera)	landscape gardener	(190)	1	NA	+	+	ND	ND	
Passion flower & Cascara sagrata (Passiflora alata & Rhamnus purshiana)	Pharmacy technician	(191)	1	NA	+	+	Immunoblotting	+	
Sarsaparilla root	Herbal tea worker	(192)	1	NA	+	+	ND	+	
Olive oilcake	Oil industry	(193)	1	NA	+	ND	ND	+	
Brazil ginseng (Pfaffia paniculata)	Medicinal plant processor	(194)	1	NA	+	+	Negative precipitins	+	
Sanyak (Dioscorea Batatas) and Korean ginseng (Panax ginseng)	Herbal merchant	(195)	1	NA	+	+	Immunoblotting	+	
Voacanga Africana seed dust	Chemist' spouse	(196)	1	NA	+	+	Negative precipitins	+	
Tampico fiber in agave leaves	Brush-makers	(197)	2	NA	+	ND	Immunoblotting	+	
Onion	Homemakers	(198)	3	NA	+	+	ND	+	
Onion seeds (Allium cepa, red onion)	Seed packing	(199)	1	NA	+	+	Immunoblotting	+	
Feenel seed	Sausage processing	(200)	1	NA	ND	+	Immunoblotting	ND	
Sesame seed	Baker	(201)	1	NA	+	+	Immunoblotting	+	
Linseed oilcake	Chemist	(202)	1	NA	+	+	ND	+	
Grass juice	Gardener	(203)	1	NA	+	+	Immunoblotting	+	
Potato	Housewives	(204)	2	NA	+	+	Histamine release	+	
Tomato and cucumber	Greenhouse workers	(205)	14	NA	+	+		+	PEF
Citrus food handling (d,l –limonene, citronellol and dichloroprene)	Labourer	(206)	1	NA	-	+	ND	ND	
Carrot (Daucus carota L.)	Cook	(207)	1	NA	+	+	SDS-PAGE	+	
Asparagus	Food processor	(208)	1	NA	+	+	Immunoblotting	+	
Courgette	Fruit warehouse	(209)	1	NA	+	+	ND	ND	
Cauliflower and cabbage	Restaurant	(210)	1	NA	+	+	ND	+	
Lettuce	Farmers	(211)	13	1.4%	+ 62%	+ 46%	Immunoblotting	ND	

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Spinach powder	Pasta factory	(212)	1	NA	+	+	Lymphocyte activation test	+	eosinophils in BAL anaphylaxis on eating celeriac
Celeriac	Plant preparing vegetables	(213)	1	NA	+	+			
Swiss chard (<i>Beta vulgaris</i> L. <i>cycla</i>)	Housewife	(214)	1	NA	+	+	Histamine release	+	
Cacoon seed (<i>Entaga gigas</i>)	Decorator	(215)	1	NA	+	ND	ND	ND	
Dusts from seeds of Sacha Inchi (<i>Plukenetia volubis</i>)	Cosmetic factory	(216)	1	NA	+	ND	SDS-PAGE	+	
Chicory	Vegetable wholesaler	(217)	1	NA	+	+	Immunoblotting	ND	
Rose hip	Pharmaceutical	(218)	9	NA	67% +	67% +	ND	50% of 4 +	
Garlic dust	Food packaging	(219)	1	NA	+	+	ND	+	
		(220)	1	NA	+	+	RAST inhibition	+	
Liquorice roots (<i>Glycyrrhiza</i> spp)	Herbalist	(221)	1	NA	+	+	ND	+	
Esparto (<i>Stipa tenacissima</i> and <i>Lygeum spartum</i>)	Stucco handler	(222)	1	NA	+	+	Immunoblotting	ND	PEF
Spices	Spices processing	(223)	1	NA	+	+	ND	ND	
Saffron (<i>Crocus sativus</i>)	Saffron processors	(224)	5	10%	6%+	26%	Immunoblotting RAST inhibition	+ in one	
Aromatic herbs	Butcher	(225)	1	NA	+	+	ND	+	PEF
Lycopodium powder	Preservative makers	(226)	30	7%	ND	ND	ND	2/2 +	
Weeping fig (<i>Ficus benjamina</i>)	Plant keepers	(227)	84	7%	21% +	21%	ND	100% of 6 +	PC20
Henna (unspecified)	Hairdressers	(228)	2	NA	+	+	ND	1/2 +	
Fenugreek	Food industry	(229)	1	NA	+	+	ND	ND	
Aniseed	Food industry	(230)	1	NA	+	+	ND	+	
Kapok	Sewer	(231)	1	NA	-	-	ND	+	Lung function
Argan (<i>Argania spinosa</i>)	Cosmetic factory	(232)	3	33.3% (3/9) + in one		negative	Immunoblotting	+	
Miracle tree (<i>Moringa oleifera</i>) seed	Technician (cosmetic factory)	(233)	1	NA	+	ND	+ SDS-Page	+	PEF
Melon	Agricultural Worker	(234)	1	NA	+	ND	Immunoblotting	+	

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
Cellulose	Operator sanitary pad production	(235)	1	NA	negative	negative	ND	+	PEF
<u>Plant-derived natural products</u>									
Gluten	Baker	(236)	1	NA	+	+	RAST inhibition	+	
Soybean lecithin	Bakers	(237)	2	NA	+	+	ND	+	
Pectin	Christmas candy maker	(238)	1	NA	+	-	Specific IgG4	+	
Latex	Glove manufacturers	(239)	81	6%	11%+	ND	ND	ND	PEF
	Health professionals	(240)	7	2.5%	4.7%+	ND	ND	+	
Rose oil	Rose extraction	(241)	52	NA	+	ND	ND	ND	
<u>Biologic enzymes</u>									
Bacillus subtilis	Detergent industry	(242)	1642	3.2%	4.5-75% (over 7 years)	+26% of 248 +	ND	ND	Lung function
	Factory workers	((243)	38	NA	66% +	ND	Passive transfer 100% of 5 + + Precipitin (nonspecific)	90 %+	Lung function
Trypsin	Plastic, pharmaceutical	(244)	14	29%	+	+	ND	75 % of 4 +	
Papain	Pharmaceutical	(245)	29	45%	34% +	34% +	ND	89% of 9 +	
Pepsin	Pharmaceutical	(246)	1	NA	+	+		+	
Pancreatin	Pharmaceutical	(247)	14	NA	93% +	100% of 3 +	ND	100% of 8 +	Lung function
Flaviastase	Pharmaceutical	(248)	3	NA	+	+	+ Precipitin	ND	
Bromelin	Pharmaceutical	(249)	76	11%	25% +	ND	ND	ND	
		(250)	2	NA	+	ND	ND	2/2 +	
Egg lysosyme	Pharmaceutical	(251)	1	NA	+	+	ND	+	PEF
Fungal amylase	Bakers	(252)	118	NA	100% of 10 +	2% exposed	ND	ND	
					34% occup. asthma +				
Phytase	Baker	(253)	1	NA	+	+	ND	+	
from Aspergillus niger	Technicians	(254)	53	36%	ND	+	SDS-PAGE	ND	

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
Fungal amyloglucosidase and hemicellulase	Bakers	(255)	140	NA	ND	5-24%	ND	ND	
Serratia peptidase and lysozyme chloride	Pharmaceutical	(256)	1	NA	ND	+	Immunoblotting	+	
Esperase	Detergent industry	(257)	667	NA	ND	5%	ND	ND	
Xylanase	Laboratory workers	(258)	2	NA	2	2	ND	ND	PEF
Pectinase and glucanase	Fruit processors	(259)	3	NA	ND	pos	Immunoblotting	ND	PEF
Lactase	Pharmaceutical	(260)	207	4%	31% +	ND	ND	ND	
Empynase (pronase B)	Hospital personnel	(261)	6	3.9%	20%	+	Immunoblotting	ND	
Various enzymes in rennet production (proteases, pepsine, chymosines)	Cheese producers	(262)	6	17%	40% +	ND	ND	ND	
Lallzyme EX-V (from <i>Aspergillus niger</i>)	Wine cellar	(263)	1	NA	+	ND	Immunoblotting	+	
Protease	Operator in a dishwashing tablet factory	(264)	1	NA	+	+	ND	+	FeNO
Chymosine	Cheese maker	(265)	1	NA	+(rennet)	+	Immunoblotting	ND	Improvement away from work
<u>Vegetable Gums</u>									
Acacia	Printers	(266)	63	19% of 31 (selection)	ND	ND	ND	ND	
	Printers	(267)	10	NA	+	ND	Passive transfer (3 +)	ND	
Tragacanth	Gum importer	(268)	1	NA	+	ND	ND	ND	
Karaya	Hairdressers	(269)	9	4%	+	ND	Passive transfer	ND	
Guar	Carpet manufacturing	(270)	162	2%	5% +	8% +	ND	67 % of 3 +	PC20
Gutta-percha	Dental hygienist	(271)	1	NA	+	ND	ND	ND	

Low molecular weight agents

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
<u>Diisocyanates</u>									
Toluene diisocyanate	Polyurethane	(272)	112	12.5%	3%+	0%+	0%+	45% of 11+ PCA	Specific IgG
	Plastics, varnish	(273)	26	NA	ND	19%+	ND	100%+	
	Plastics, varnish	(274)	195	28%	ND	5%+	ND	70% of 17+	
	Pastics, varnish	(275)	91	NA	NA	ND	0%+	ND	
	Plastics, varnish	(276)	162 †	NA	ND	ND	ND	57%+	
Diphenylmethane diisocyanate	Foundry	(277)	11	NA	ND	27%+	36%+ Specific IgG	54.5%+	
	Foundry	(278)	76	13%	ND	3%+	7%+ Specific IgG	ND	
	Steel foundry	(279)	26	27%	4%+	4%+	15%+ Specific IgG	ND	
1,5 Naphthylene diisocyanate	Rubber manufacture	(280)	3	NA	ND	ND	ND	100%+	
Isophorone diisocyanate	Spray painter	(281)	1	NA	ND	ND	ND	+	
Prepolymers of TDI	Floor varnishers	(282)	2	NA	ND	0% +	Negative specific IgG	+	
Prepolymers of HDI	Spray painters	(283)	9	45%	ND	33% +	56% +	+	
<u>Combination of diisocyanates</u>									
TDI, MDI, HDI, PPI	Spray painters	(284)	51	11.8%	ND	ND	ND	60% of 10+ to PPI	TDI,
MDI, HDI	Various industries	(285)	24	NA	ND	ND	ND	70% + to TDI 33% + to MDI 33% of 9+ to HDI	
	Chemical manufacturing	(286)	247	NA	60% of 53+ 14% +	ND	ND		
	Paint shop	(287)	62	NA	ND	15%+	47%+ specific IgG	6%+ to TDI 16% to MDI 24% to HDI	

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
TDI, MDI	Chemical manufacturing	(288)	28	NA	ND	27% of 22+ TDI-HSA 83% of 6+ MDI-HSA	ND	100%+	
<u>Other hardeners</u>									
Triglycidyl isocyanurate	Spray painter	(289)	1	NA	ND	ND	ND	+	PEF
Polyfunctional aziridine	Hardener in paints	(290)	7	NA	33% of 7	ND	ND	+ in 7	
Bisphenol A diglycidyl ether (BADGE)	Epoxy resin	(291)	1	NA	+	+	ND	+	
		(292)	2	NA	ND	ND	ND	+	
<u>Anhydrides</u>									
Phthalic anhydride	Plastics Toolsetter, resin plant agent	(293)	1	NA	+	+	ND	+	
		(294)	3	NA	ND	ND	ND	100%+	
	Production of resins	(295)	118	28%	18% of 11+	ND	ND		
		(296)	60	14%	ND	7%+	17%+ Specific IgG	ND	
Trimellitic anhydride	Epoxy resins, plastics	(297)	4	NA	100%+	75%+	100%+	100% of 1+	
Tetrachlorophthalic anhydride	Epoxy resins, plastics Factory (plastic coating)	(298)	5	NA	ND	ND	ND	100%+	
		(299)	7	NA	100%+	100%+	ND	100%+	
Pyromellitic dianhydride	Epoxy adhesive	(300)	7	NA	ND	ND	ND	30%+	
Methyl tetrahydrophthalic anhydride (MTHPA)	Curing agent	(301)	1	NA	+	+	Negative specific IgG	ND	Improvement with removal
Hexahydrophthalic anhydride (HHPA)	Chemical worker	(302)	1	NA	ND	ND	ND	+	PEF

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
MTHPA + HHPA	Electrical plant	(303)	109	5.4%	ND	15.4%	ND	6/17	
Himic anhydride	Manufacture of flame retardant	(304)	20	35%	ND	40% of 7+	RAST inhibition	ND	PC20, FENO
Chlorendic anhydride	Mechanics	(305)	1	NA	+	+	ND	+	PEF
Maleic anhydride	Polyester resin production	(306)	1	NA	ND	ND	ND	+	
Diocetyl-phthalate	Production of PVC	(307)	1	NA	ND	ND	ND	ND	PEF
<u>Aliphatic amines (ethyleneamines)</u>									
Ethylene diamine	Shellac handlers	(308)	7	NA	100%+	ND	ND	100%+	
	Photography	(309)	1	NA	ND	ND	ND	+	
Ethylene diamine tetraacetic acid (EDTA) sodium salts	Cleaners and health care professionals	(310)	8	NA	ND	ND	ND	+(nasal)	PC20
Isophorone diamine(IPDA)	Epoxy floor coaster	(311)	1	NA	Negative	ND	ND	+	PC20, FeNO
Hexamethylene tetramine	Lacquer handlers	(308)	7	NA	100%+	ND	ND	100%+	
Aliphatic polyamine	Chemical factory	(312)	12	4/12	ND	ND	ND	100% of 2 +	
Triethylene tetramine	Aircraft filter	(294)	1	NA	ND	ND	ND	+	
Mixture of trimethyl-hexanediamine and isophorondiamine	Floor covering material salesman	(313)	1	NA	-	ND	ND	+	BAL
<u>Aliphatic amines (ethanolamines)</u>									
Monoethanolamine	Beauty culture	(308)	10	100% +	ND	ND	ND	100% +	
Triethanolamine	Metal worker	(314)	2	NA	ND	ND	ND	100% of 2	
Aminoethylethanolamine	Soldering	(315)	3	NA	ND	ND	ND	100% +	
	Cable jointer	(316)	2	NA	ND	ND	ND	+	
Dimethylethanolamine	Spray paint	(317)	1	NA	-	ND	ND	+	

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
<u>Aliphatic amines (others)</u>									
3-(Dimethylamino)-propylamine (3-DMAPA)	Ski manufacture	(318)	34	11.7%	ND	ND	ND	ND	Cross-shift change in FEV1
<u>Heterocyclic amines</u>									
Piperazine hydrochloride	Chemist	(319)	2	NA	50%+	ND	ND	100%	
	Pharmaceutical	(320)	131	11.4%	ND	ND	ND	100% of 1+	
	Chemical plant	(321)	2	NA	50%+	100%+	ND	ND	
N-Methylmorpholine		(322)	48	16.6%	ND	ND	ND	ND	
4,4-methylene-bis-morpholine	Machine tool setter operator	(323)	1	NA	+	ND	ND	+	PEF
<u>Aromatic amines</u>									
Paraphenylene diamine	Fur dyeing	(324)	80	37.0%	66%+	ND	ND	74%+	
	Hair dyers	(325)	5	NA	Negative	ND	ND	+	
<u>Quaternary ammonium</u>									
Various compounds	Cleaners	(326)	22	NA	ND	ND	ND	+	changes in PC20 and sputum eosinophils
Benzalkonium chloride	Cleaning product	(327)	1	NA	+	ND	ND	+	
<u>Mixture of amines</u>									
EPO 60	Mould maker	(328)	1	NA	ND	ND	ND	+	
<u>Fluxes</u>									
Colophony	Electronic workers	(329)	34	NA	ND	ND	ND	100%+	
	Manufacture	(330)	68 low	4%	ND	ND	ND	ND	
	solder flux		14 med	21%	ND	ND	ND	ND	
			6 high	21%	ND	ND	ND	ND	
Zinc chloride & ammonium chloride flux	Metal jointing	(331)	2	NA	ND	ND	ND	+	PC20
95% Alkylaryl polyether alcohol +5% polypropylene glycol	Electronic assembler	(332)	1	NA	ND	ND	ND	+	

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
Adipic acid	Solderer	(333)	1	NA	ND	ND	ND	+	PEF
Lipophilic resin	Aerospace plant	(334)	1	NA	ND	ND	ND	ND	Improvement off-work
<u>Wood dust or bark</u>									
Western red cedar (Thuja plicata)	Carpentry	(335)	35	NA	ND	ND	ND	ND	Improvement on removal
	Furniture making	(336)	1320	3.4%	1.9%+	ND	ND	ND	
	Cabinet making, carpentry	(337)	22		100% negative	ND	100% negative precipitins	82% +	
	Sawmill	(338)	185		100% negative	ND	ND	100% +	
	Sawmill	(339)	652	4.1%	100% negative	ND	ND	ND	Questionnaire
Eastern white cedar (Thuja occidentalis)	Sawmill	(340)	3	4-7%	ND	ND	ND	+	PC20
California redwood (Sequoia sempervirens)	Woodcarvers	(341)	2	NA	-	ND	Negative precipitins		
	Carpenter	(342)	1	NA	ND	ND		ND	+
Cedar of Lebanon (Cedra libani)		(343)	6	NA	17%+	ND	100% negative precipitins	ND	
Spruce wood (unspecified)	Sawmill worker	(344)	1	NA	ND	+	ND	ND	PEF +
Cocabolla (Dalbergia retusa)	Woodworkers	(345)	3	NA	100% negative	ND	ND	ND	Induced sputum
Iroko (Chlorophora excelsa)	Carpenter	(346)	1	NA	+	ND	+ Precipitin	+	Improvement on removal
	Carpenter	(347)	1	NA	ND	ND	ND	+	
	Woodworkers	(348)	9	NA	4/9 with +	negative	ND	+	PEF
					Intradermal test				
Oak (Quercus robur)	Lumber milworker	(349)	1	NA	-	ND	+	+	
	Construction, carpentry	(350)	3	NA	ND	ND	+ Precipitin	+	
Mahogany (unspecified)	Pattern maker(wood)	(349)	1	NA	-	ND	+ Precipitin	+	
Abiruana (Pouteria)	Furniture factory	(351)	2	NA	+	ND	Negative precipitin	+	

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
African Maple (<i>Triplochiton scleroxylon</i>)	Construction, carpentry	(352)	2	NA	+	+	Passive transfer	+	
	Sauna building	(353)	2	NA	100%+	100%+		+	
	Maker of wooden plane model	(354)	1	NA	+	+	ND	+	
Tanganyika aningre	Woodworkers	(355)	3	NA	100% +	100% -	100% - Precipitin	100%+	
Mukali (<i>Angineria robusta</i>)	Furniture factory	(356)	1	NA	+	+	ND	+	
Central American Walnut (<i>Juglans olanchana</i>)	?	(357)	1	NA	-	-	Negative precipitins	+	
Kejaat (<i>Pterocarpus angolensis</i>)	Wood-machinist	(358)	1	NA	+	ND	ND	ND	
African zebra wood (<i>Microberlinia</i>)	Wood-machinist	(359)	1	NA	+	+	ND	+	
Ramin (<i>Gonystylus bancanus</i>)	Woodworker	(360)	2	NA	+	+	ND	+	
Quillaja bark (<i>Quillaja saponaria</i>)	Saponin factory	(361)	1	NA	ND	+	ND	+	
Fernambouc (<i>Caesalpinia echinata</i>)	Bow making	(362)	36	33.3%	100% -	ND	ND	100% of 1+	
White Ash (<i>Fraxinus americana</i>)	Sawmill	(363)	1	NA	-	-	ND	+	
Common Ash (<i>Fraxinus escelsior</i>)	Furniture	(364)	1	NA	-	+	ND	+	
Pau Marfim (<i>Balfourodendron riedelianum</i>)	Wood-worker	(365)	1	NA	+	+	ND	+	
Capreuva (<i>Myrocarpus fastigiatus</i> Fr. All.)	Parquet floor layer	(366)	1	NA	ND	ND	ND	+	
Ebony wood (<i>Diospyros crassiflora</i>)	Carpenter	(367)	1	NA	-	ND	ND	+	
Kotibe wood (<i>Nesorgordonia papverifera</i>)	Cabinet maker	(368)	1	NA	+	ND	Passive transfer	+	
Cinnamon (<i>Cinnamomum Zeylanicum</i>)	Store workers	(369)	40	22.5%	ND	ND	ND	100% of 1 +	
Imbuia (Brazilian walnut)	Furniture	(370)	1	NA	ND	ND	+ Precipitin	+	Negative PEF

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
Blackwood (Acacia Melanoxylon)	Furniture	(371)	3	NA	ND	ND	ND	+	PEF
African Cherry (Makore)	Cabinet worker	(372)	1	NA	-	ND	ND	+	
Antiaris	Door manufacturer	(373)	1	NA	+	+	SDS-PAGE	+	
Sapele wooddust	Carpenter	(374)	1	NA	ND	ND	+ Immunoblotting	ND	
Ipe (Tabebuia spp)	Sawyer	(375)	1	NA	ND	ND	ND	+	
Angelim pedra (Hymenolobium petraeum)	Carpenter	(376)	1	NA	+	ND	SDS-PAGE	+	
Cedorana (Cedrelinga catenaeformis Ducke)	Carpenter	(377)	1	NA	+	+	SDS-PAGE	+	
Falcata (Albizia falcata)	Wood furniture	(378)	1	NA	+	ND	ND	+	
Chengal (Neobalanocarpus hemeii)	Carpenter	(379)	1	NA	ND	ND	ND	+	+ PEF
Padauk (Pterocarpus soyauxii)	Cabinet maker	(380)	1	NA	-	+	No binding proteins	+	
Unidentified agent	Sawmills of Eastern Canada and USA	(381)	11	NA	ND	ND	ND	+	PEF
<u>Metals</u>									
Platinum	Platinum refinery	(382)	16	NA	62%+	ND	ND	62%+	
		(383)	136	29%	17%+	21%+	ND	ND	
Tetrachloroplatinate	Production of cytotoxic drugs (Cisplatin)	(384)	1	NA	Not interpretable	ND	ND	+	
Nickel sulfate	Metal plating	(385)	1	NA	+	ND	-	+	
	Metal polisher	(386)	1	NA	+	ND	-	Precipitin	
Cobalt	Electroplating	(387)	1	NA	+	+	ND	+	
	Hard metal grinders	(388)	4	NA	25%+	ND	ND	50%+	
	Diamond polisher	(389)	3	NA	ND	ND	ND	100%+	
Iron (unspecified)	Welders	(390)	3	NA	ND	ND	ND	+	Induced sputum
Palladium tetraamine dichloride	Assembly line	(391)	1	NA	+	ND	ND	+	
Rhodium	Assembly line	(392)	1	NA	+	ND	ND	+	

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
Zinc fumes	Solderers	(393)	2	NA	ND	ND	ND	+	
	Locksmith	(394)	1	NA	ND	ND	ND	+	
Tungsten carbide	Metal grinder	(395)	1	NA	ND	ND	ND	ND	Recovery on removal
Chromium	Printer	(396)	1	NA	+	ND	ND	ND	
Chromate	Cement floorer	(397)	1	NA	ND	ND	ND	+	
	Plater	(398)	1	NA	+	ND	ND	ND	
	Various	(399)	4	NA	+	ND	ND	+	
Stellite (alloy containing 60% cobalt, 30% chromium, tungsten and carbon)									
Chromium & Nickel	Machinist	(400)	1	NA	Negative to metals	ND	-	+	
	Welder	(401)	5	NA	ND	ND	ND	100% of 2+	
	Tanning	(402)	1	NA	-	+	ND	+	
	Electroplating	(403)	7	NA	Cr 29%+ Ni 57%+	ND	ND	Cr 100% of 7	
Cobalt & Nickel	Hard metal plant	(404)	8	NA	Cobalt: 75% Nickel: 62%	Cobalt: 62% Nickel: 50%	ND	Both cobalt and nickel 100%+	
Aluminium	Soldering	(405)	1	NA	ND	ND	ND	+	
Aluminium tetrafluorides	Production line (using a flux)	(406)	3	NA	ND	ND	ND	+	
		(407)	1	NA	ND	ND	ND	+	PEF recording
Aluminium hydroxide	Foundry worker	(408)	1	NA	neg	ND	ND	+	
Aluminium oxide	Worker handling	(409)	1	NA	ND	ND	ND	+	
(?) Fluorine	Potroom	(410)	52	NA	ND	ND	ND	ND	History
(?) Aluminium	Potroom	(411)	227	7%	ND	ND	ND	ND	Questionnaire
	Potroom	(412)	35	NA	ND	ND	ND	ND	History
	Potroom	(413)	57	NA	ND	ND	ND	ND	History
	Potroom	(414)	1	NA	ND	ND	ND	+	PEF monitoring
Manganese	Welder	(415)	1	NA	ND	ND	ND	+	

Drugs

Penicillins & Ampicillin	Pharmaceutical	(416)	4	NA	100% negative	ND	ND	75% +	
Penicillamine	Pharmaceutical	(417)	1	NA	ND	-	ND	+	PEF
Cephalosporins	Pharmaceutical	(418)	2	NA	+	ND	ND	+	
	Pharmaceutical	(419)	91	8%	71%+	ND	ND	ND	Improvement off work
	Pharmaceutical	(420)	161	15.5%	3.1%	17.4%	ELISA Inhibition	ND	ND
				(symptoms)					
Colistin	Pharmaceutical	(421)	1	NA	ND	ND	ND	+	
Thiamphenicol	Pharmaceutical	(422)	3	NA	67% +	67% +	ND	+	
7-aminocephalosporanic acid	Pharmaceutical	(423)	2	NA	+	+	RAST Inhibition	+	
Phenylglycine acid chloride hydrochloride	Pharmaceutical	(424)	24	29%	37% +	37% +	Passive transfer	100% of 2 +	
Psyllium	Laxative manuf.	(425)	3	NA	100%+	ND	ND	60% +	
	Pharmaceutical	(426)	130	4%	19% of 120+	26% of 118+	ND	27% of 18+	
	Nurses	(427)	5	NA	80%+	100% +	ND	100% +	
	Health personnel	(428)	193	4%	3%+	12% of 162 +	ND	26% of 15+	
Methyl dopa	Pharmaceutical	(429)	1	NA	-	ND	ND	+	
Spiramycin	Pharmaceutical	(430)	1	NA	+	ND	ND	+	
	Pharmaceutical	(431)	51	8 %	100%-	ND	ND	25% of 12+	
	Pharmaceutical	(432)	2	NA	ND	-	ND	+	
	Pharmaceutical	(433)	1	NA	-	ND	ND	+	
Salbutamol intermediate	Pharmaceutical	(433)	1	NA	-	ND	ND	+	
Amprolium	Poultry feed mixer	(434)	1	NA	ND	ND	ND	+	
Tetracycline	Pharmaceutical	(435)	1	NA	ND	ND	ND	+	
Isonicotinic acid hydrazide	Hospital pharmacy	(436)	1	NA	+	+	ND	+	
Hydralazine	Pharmaceutical	(437)	1	NA	-	-	Negative specific IgG	+	
Tylosin tartrate	Pharmaceutical	(438)	1	NA	ND	ND	ND	+	
Ipecacuanha	Pharmaceutical	(439)	42	48%	52% of 19+	66% of 18+	ND	ND	
Cimetidine	Pharmaceutical	(440)	4	NA	ND	ND	ND	25% +	
Thiamine	Cereal manufacture	(441)	1	NA	ND	-	ND	+	
Aescin	Pharmaceutical	(442)	1	NA	ND	ND	ND	+	
Lasamide	Chemical workers	(443)	3	NA	3 +	ND	ND	+	
(precursor of furosemide)									
5-aminosalicylic acid	Pharmaceutical	(444)	1	NA	neg	ND	ND	+	
Piperacillin	Pharmaceutical	(445)	1	NA	+	ND	ND	+	
Ceftazidime	Pharmaceutical	(446)	1	NA	ND	ND	ND	+	
Opiate compounds	Pharmaceutical	(447)	39	26%	+	ND	ND	ND	PEF
	Pharmaceutical	(448)	4	14%	+	+	ND	+	Pre-post shift FEV1
Amoxicillin	Pharmaceutical	(449)	1	NA	-	-	ND	+	

Vancomycin	Pharmaceutical	(450)	1	NA	ND	ND	ND	Histamine release	PEF
Mitoxantrone	Nurse	(451)	1	NA	ND	ND	ND	+	PEF; alveolar lavage
Tafenoquine	Pharmacist	(452)	1	NA	ND	Negative	ND	+	
Ranitidine	Packaging	(453)	1	NA	-	ND	ND	+	
(1,1-Ethenediamine, N-[2-[[[5-[(dimethylamino) methyl]-2-furanyl] methyl]thio]ethyl]- N'-methyl-2-nitro)	pharmaceutical company								
Minoxidil	Beautician	(454)	1	NA	negative	ND	ND		negative (but changes in induced sputum and PC20)
Ferrimanitol	Worker	(454)	1	NA	negative	ND	+ immunoblotting	+	
Ovalbumin (FMOA)	pharmaceutical company								
Clarithromycin	Worker	(454)	1	NA	negative	ND	ND	+	
Glucosamine hydrochloride	pharmaceutical company Cleaner	(454)	1	NA	negative	ND	ND	+	
<u>Reactive dyes</u>									
Reactive dyes	Reactive dyes manufacture	(455)	309	25%	7%+ orange 8%+ black	17%+ orange 17%+ black	ND	65% of 20+	
	Wool dye house	(456)	6	NA	ND	83%+	100%+	ND	
	Textile dyehouse	(457)	162	NA	NA	85% of 5 +	ND	ND	
Levafix brilliant yellow E36	Preparation of dye solution	(458)	1	NA	+	ND	ND	+	
Drimaren brilliant yellow K-3GL	Textile industry	(459)	1	NA	+	ND	ND	+	
Black henna (Indigofera argentea)	Herbal shop sales	(460)	1	NA	+	+	ND	ND	PEF
FD&C blue dye #2	Food industry	(461)	1	NA	-	-	ND	+	

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
Cibachrome brilliant scarlet 32	Textile industry	(459)	1	NA	+	ND	ND	+	
Drimaren brilliant blue K-BL	Textile industry	(459)	1	NA	+	ND	ND	+	
Lanasol Yellow 4G	Dyer	(459)	1	NA	+	ND	ND	+	
Synozol Red-K 3BS	Textile worker	(462)	1	NA	+	+	ND	+	
Carmine	Dye manufacture	(463)	10	NA	30% +	30% +	ND	100% of 1	
Monascus ruber	Delicatessen plant	(464)	1	NA	+	ND	+ Immunoblotting	+	PC20
Sudan red dye	Cosmetic packaging	(465)	1	NA	ND	ND	ND	+	
Indigo (Indigofera tinctoria)	Hairdressers	(466)	2	NA	+	ND	ND	+	
<u>Biocides</u>									
Hexachlorophene	Hospital staff (sterilizing agent)	(467)	1	NA	ND	ND	ND	+	
Chlorhexidine	Nurse	(468)	2	NA	ND	ND	ND	+	
Glutaraldehyde	Hospital endoscopy unit	(469)	9	89%	ND	ND	ND	ND	Questionnaire
	Endoscopy & Radiology	(470)	8	NA	ND	ND	ND	7/8 +	PEF monitoring
Ortho-phthalaldehyde	Endoscopy unit	(471)	1	NA	ND	ND	ND	ND	Improvement away from work
Hydroxylamine	Paper recycling	(472)	3	NA	ND	ND	ND	1 +	PEF
Peracetic acid-hydrogen peroxide mixture	Endoscopy unit	(473)	2	NA	ND	ND	ND	2 +	PEF
Chloramine T	Chemical manufacturing	(474)	6	NA	100%+	ND	66%+	ND	
	Brewery	(475)	7	NA	100%+	ND	Passive transfer ND	ND	Recovery with removal
	Janitor-cleaning	(476)	5	NA	100% of 4+	ND	ND	100% of 3+	
Chloramine (unspecified)	Lifeguard	(477)	3	NA	ND	ND	ND	+	PEF
	Swimming teacher								
Lauryl dimethyl benzyl ammonium chloride	Pharmacist	(478)	1	NA	ND	ND	ND	+	PEF

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
<u>Chemicals</u>									
Isothiazolinone	Chemical plant	(479)	1	NA	ND	ND	ND	+	
Triclosan	Nursery nurse	(480)	1	NA	ND	ND	ND	+	PEF
<u>Fungicides</u>									
Tetrachloro-isophthalonitrile	Farmer	(481)	1	NA	ND	-	+ Patch test	+	FEV1 recording at work
Tributyl tin oxide	Venipuncture technician	(482)	1	NA	-	ND	ND	+	
Captafol	Chemical manufacturing	(483)	1	NA	-	ND	ND	+	
Polyvinyl chloride (fumes)	Meat wrapper	(484)	96	69%	ND	ND	ND	27% of 11+	
Polyvinyl chloride (fumes and powder)	Meat wrapper	(485)	3	NA	ND	ND	ND	ND	History only
Polyvinyl chloride (powder)	Wallpaper manufacturing	(486)	1	NA	+	ND	ND	+	asthma to nickel
Organic phosphate insecticides	Chemical packaging plant	(487)	1	NA	ND	ND	ND	ND	History only
Tetramethrin	Extermination	(488)	1	NA	-	ND	ND	+	PC20
Persulphate salts & henna	Hairdressing	(489)	2	NA	+	ND	ND	+	
	Hairdressing	(490)	2	NA	+	ND	ND	+	
	Hairdressing	(491)	23	17%	4% +	ND	ND	100% of 4+	
	Hairdressing	(492)	1	NA	-	ND	ND	+	
	Hairdressing	(493)	1	NA	ND	ND	ND	+	
Yellow and red henna	Hairdressing	(494)	1	NA	+	ND	ND	+	+ rhinomanometry
Eugenol	Hairdressing	(495)	1	NA - (prick)+(patch)		ND	Mononuclear proliferation	+	
Diazonium salt	Manufacturing of photocopy paper	(496)	1	NA	ND	ND	ND	+	
	Manufacture of fluorine polymer precursor	(497)	45	56	ND	20%+	ND	100% of 2	

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
Urea formaldehyde	Resin	(498)	2	NA	-	ND	ND	+	
	Resin	(499)	3	NA	ND	ND	ND	100% of 3	
	Manufacture of foam	(500)	1	NA	ND	ND	ND	+	
Popcorn flavoring chemical	Popcorn makers	(501)	3	NA	ND	ND	ND	ND	
Freon (unspecified)	Refrigeration	(502)	1	NA	ND	ND	ND	+	
Furfuryl alcohol (furan based resin)	Foundry mold making	(503)	1	NA	ND	ND	ND	+	
	Plastics factory	(504)	2	NA	-	ND	ND	+	
Azobisformamide	Plastics, rubber	(505)	151	18.5%	ND	ND	ND	ND	Removal with improvement
	Plastic	(506)	2	NA	ND	ND	ND	+	
	Plastics	(507)	4	NA	ND	ND	ND	100% of 2+	
Sodium isononyl oxybenzene sulfonate	Laboratory technician	(508)	1	NA	ND	ND	ND	+	
Peptide coupling reagent (TBTU and HBTU)	Laboratory technician	(509)	1	NA	+	Negative	ND	+	
3-amino-5-mercapto-1,2,4-triazole	Herbicide production	(510)	6	NA	ND	ND	Specific IgG	ND	PEF
Tetrazene	Detonator manufacture	(511)	1	NA	ND	ND	ND	+	PEF
Polyethylene	Paper packer	(512)	1	NA	ND	ND	ND	+	PEF
Tall oil	Rubber tyre manufacturer	(513)	1	NA	-	ND	Negative patch test	+	PEF
Sulfites unspecified	Water plant	(514)	1	NA	-	ND	ND	Oral +	
Sodium metabisulfite	Food processor	(515)	1	NA	ND	ND	ND	+	
Sodium bisulfite	Fishing industry	(516)	1	NA	ND	ND	ND	+	
Polypropylene	Bag manufacturer	(517)	1	NA	ND	ND	ND	+	PEF
Polyester	Painter	(518)	1	NA	ND	ND	ND	+	Alveolitis
Glacial acetic acid	Picking	(519)	1	NA	ND	ND	+	ND	
Ninhydrin	Laboratory worker	(520)	1	NA	ND	ND	ND	+	PEF
1,2-Benzisothiazolin-3-one	Chemical worker	(521)	1	NA	ND	ND	ND	+	
3-Bromomethyl-2-chloro-4-(methylsulfonyl)-benzoic acid (BCMBA)	Chemical factory worker	(522)	2	2/92 (2%)	+	ND	ND	+	
Metabisulfite	Agricultural producer	(515)	1	NA	ND	ND	ND	ND	

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	Other evidence
Tert-butylhydroquinone	Chemical plant producing antioxidants	(523)	1	NA	ND	ND	ND	+	
<u>Health Care</u>									
Ethylene oxide	Nurse	(524)	1	NA	ND	+	ND	+	Changes in PC20
Enflurane	Hospital staff	(525)	1	NA	ND	ND	ND	+	
Sevoflurane and isoflurane	Anesthesiology staff	(526)	3	NA	ND	ND	ND	+	
Methyl blue	Hospital staff	(527)	1	NA	ND	ND	ND	+	
Terpene	Hospital staff	(528)	1	NA	ND	ND	ND	+	
Radiographic fixative	Hospital staff	(529)	1	NA	ND	ND	ND	+	
Sulfathiazole	Hospital staff	(530)	2	NA	-	ND	ND	+	
Formaldehyde	Hospital staff	(531)	28	29%	ND	ND	ND	50% of 4+	
	Various industries	(532)	15	NA	ND	ND	ND	60% +	
	Various industries	(533)	230	5%	ND	ND	ND	5% +	
<u>Methyl methacrylate & cyanoacrylates</u>									
	Adhesive	(534)	7	NA	ND	ND	ND	86% +	PEF 14% +
	Nurse	(535)	1	NA	ND	ND	ND	+	
	Glue	(536)	1	NA	ND	ND	ND	+	PEF
	Fingernail	(537)	1	NA	ND	ND	ND	+	
	Various	(538)	55	NA	ND	ND	ND	+ in all	
Triacrylate (unspecified)	Printing	(539)	1	NA	ND	ND	ND	+	
Ethoxylated-2-bisphenol-A-diacrylate	Autobody shop	(540)	1	NA	ND	ND	ND	+	
<u>Synthetic Material</u>									
Plexiglass	Factory	(541)	1		ND	ND	ND	+	Pre-post change in FEV1
Tooth enamel dust	Dentist	(542)	1	NA	ND	ND	ND	ND	
ECG ink	Laboratory nurse	(527)	1	NA	+	ND	ND	+	
<u>Unidentified agents</u>									
(?)	Respiratory therapist	(543)	194	19	ND	ND	ND	ND	Questionnaire
(?)	Mineral analysis laboratory	(544)	21	24%	ND	ND	ND	ND	Questionnaire

Agent	Occupation	References	Subjects (n)	Prevalence	Skin test	Specific IgE	Other immunologic tests	Broncho-provocation test	PC20 Other evidence
(?) Oil mists	Toolsetter	(545)	1	NA	ND	ND	ND	+	PEF recording
(?) Metal working fluid	Automobile plant	(546)	12	1.5%	ND	ND	ND	ND	PC20, FEV1
(?)Pulverized fuel ash	Power station attendant	(547)	1	NA	ND	ND	ND	+	PEF monitoring
Acrylonitrile-Butadiene Styrene filaments (ABS)(?) (3D printing)	Auto-employé (3D printing)	(548)	1	NA	ND	ND	ND	ND	Worsening at work Improvement off-work

Legend: NA = not applicable; ND = not done; PEF: peak expiratory flows

Acknowledgements: A preliminary version of this table was prepared with the most appreciated contribution of Dr Moira Chan-Yeung from Vancouver (Canada) and published in the first edition of the book *Asthma in the Workplace* (Marcel Dekker, NY, 1993).

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